Monitoring and prediction of extreme weather using lightning detection network and micro-satellites in Asia

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Thunderstorm causes torrential rainfall and is the energy source of typhoon. In these decades it has been revealed that lightning discharge is a very good proxy of thunderstorm activity. We have constructed the most advanced lightning detection network using VLF radio wave in Southeast Asia, AVON. On the other hand, some developing countries in SE-Asia are going to own few micro-satellites dedicated to meteorological remote-sensing in several years as well as Japan. Making use of the lightning activity data measured by the ground-based VLF network, and information on the extent and 3-D structures of thunderclouds observed by the on-demand operation of remote-sensing micro-satellites, we will get a new way to obtain very detail semi-real time information that cannot be achieved only with existing observation methods, such as meteorological radar or surface meteorological data acquisition system. Based on those measures, we will establish the methodology to grasp the development of thunderstorms occurring in whole area of Southeast Asia and to predict their near future activities as well as typhoon intensity.

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